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especially valuable to those concerned with the welfare of our child life and adolescent population, for it is on the young citizen that the future of our country depends.

C. J. BOND.

PAMPHLETS

Age at Parenthood, Order of Birth, and Parental Longevity in relation to the Longevity of the Offspring. S. J. Holmes. Reprint from University of California Publications in Zoology, Vol. 31, No. 15.

THIS is a report on a study of considerable negative value, in the number of paths which were explored and discovered to be blind alleys. Like Woods, Mr. Holmes found that royalty are good subjects for statistical investigation, and drew his material almost entirely from Allström's *Dictionary of Royal Lineage.*

With over 4,000 cases, he found no significant correlation between age of parenthood and longevity of offspring. The study on the correlation between longevity and order of birth was inconclusive, though it rather appeared that the earlier born were the longer lived. Further analysis, however, indicated that this was complicated by a significant correlation between longevity and the interval separating one birth from the previous one. Though significant, the parent-offspring correlations for longevity were weak, and were reduced by eliminating the 0-4 age-group. But low mortality in early childhood was significantly associated with the attainment of advanced age by the parents—which is an indication of inherited vitality. Finally, he elicited the interesting fact that the birth rate among royalty has been slowly falling since the sixteenth century, but at an accelerated pace during the past fifty years.

E. M.

The Problem of the Feeble-minded in New Jersey. Research Department of the Training School at Vineland, New Jersey.

THIS little book contains four papers of considerable interest to all concerned with the problem of the feeble-minded.

Three pedigrees are reproduced and illustrated with photographs and vivid descriptive matter. These appear to be very bad cases, and if they are representative of feeble-mindedness in New Jersey the problem must be much worse there than it is in this country. Unfortunately, one of the pedigrees is in only two generations, whilst one is in three and the other in four.

From the story it would appear that some of the matings in these cases occurred whilst the parties were inmates of public institutions, and as some of the resulting children were born since 1910 we may conclude that institutional life in America has not developed to the same high standard as is the case in this country. The report makes a strong appeal and demand for some system of control. With this most social workers will agree, but it must be observed that in America, as in this country, such demands will secure few supporters until it can be shown that full advantage is being taken of such powers of control as already exist. The first need is to enforce the existing law. If it could be shown that this were done public opinion would surely then support the demand for further powers.

E. J. L.

PERIODICALS

American Journal of Physical Anthropology

Vol. XII, No. 3, Jan.-March, 1929.—A study of university women students in Minnesota shows that their stature averages 63.7 inches, 5 inches less than that of the men students; it has increased lately, no doubt owing to the improvement in women's clothing and life generally. The body weight and weight-height index are more variable in women than in men, but weight data for women of 19-20 are of more interest in connection with age-changes than as regards sex characters generally. Certain types, at any rate, of women increase in weight 18-20 and decrease afterwards. The pulse rate is 82.82 for women students and 80.18 for the men, the average systolic blood pressure 117 for the women, but 124 for the men.

Ruggles Gates states that 4 Athapascan tribes tested (on small numbers of subjects) agreed in blood-grouping but differed markedly from 16 Eskimos whom it was possible to test. This is another argument for the view of the distinctness of the Eskimo from the American Indian, a view recently much strengthened by Rasmussen's finds of remains of ancient Eskimo culture along the whole Arctic coast of America. Gates thinks that agglutinogen A arose in the blood of the human race much earlier than agglutinogen B.

H. Cummins *et al* give an elaborate study of palmar dermatoglyphics.

H. J. F.

Archiv der Julius Klaus-Stiftung

Vol. 3, Heft 3/4.—Dr. Th. Koller and Dr. U. M. Theier describe the isoagglutinins in the serum of newborn babes. As regards the inheritance of the agglutinogens A and B, there has been the view of Hirszfeld and others that two independent pairs of genes are involved, and the later view of Bernstein that A, B, and O are three multiple allelomorphs. The present writers conclude that their findings are in harmony with Bernstein's hypothesis. But more recently Dr. H. K. Bauer proposes the theory of two linked factors with crossing-over, and this may fit the facts still better. The main purpose of the present investigation was to determine the serum relations between mother and child when they belong to different blood groups.

Messrs. M. Minkowski and A. Sidler report on an extended study of the pathology and inheritance of progressive dystrophy or wasting of the muscles. The thirteen affected individuals showed much variation in the muscles affected and in accompanying symptoms, but in every case there was consanguinity in the ancestors, their pedigrees being traced back through many generations. The sporadic appearance of dystrophic individuals with normal but related ancestors argues strongly for a recessive Mendelian character.

The number also includes an extended study of the anatomy of species hybrids between *Primula verio, P. vulgaris,* and *P. elatior,* by Leo Fey.

Vol. 4, No. 1.—Otto Schlaginhaufen tabulates and discusses the ancestors and collateral relations of Gottfried Keller, a well-known Swiss, born in 1819. The chief interest of this work for us lies in the methods he adopts for showing genealogical relationships and other features relating to the ancestry. All ancestors were known for three generations back, but two of the sixteen great-great-grandparents were unknown, and only nine of the eighth ancestral generation were known, 95 of the possible 510 ancestors in eight generations being recorded. Probably few individuals outside the hereditary families would be able to muster an equal number of direct ancestors.

The bulk of this number is devoted to a cytological study of the alga-like genus *Nitella.*

R. R. G.

British Journal of Psychology

General Section, Vol. XIX, Part 4, April, 1929. *Children of High Intelligence, A Following-Up Enquiry.* By James F. Duff.—Since the value of ' intelligence tests,' when compared with the test of life, has sometimes been questioned, Mr. Duff investigated the subsequent careers of two groups of those children who took the tests in Northumberland in 1921 and 1922, and he has obtained results of considerable eugenic significance. The groups were (1) the Intelligent, 64 children with intelligence quotients of 136 or more, and (2) the Controls, 28 normal children with i.q.'s of 100.

" Of the two groups, 10 Intelligent and 7 Control were already in secondary schools when they took the test, and 4 Intelligent were given scholarships to secondary schools partly as a result of the test in question. There remain 50 Intelligent and 21 Control; the difference in the subsequent school careers is highly significant. Of the 21 Control, not one went up to a secondary school; of the 50 Intelligent, 37 went up, quite independently of their mark in this test; 23 won scholarships, 12 do not state whether or not they won scholarships, 2 certainly failed to win scholarships, though both have done particularly well at their secondary schools. To get into a secondary school at all they had to reach a qualifying standard not far below scholarship level. These facts leave no doubt that a high mark in this test is a strong indication of future scholastic success, as gauged by entry to the secondary school."

This practically settles the main question, but Mr. Duff investigated many other points of importance. In particular, he wished to discover whether the *subsequent* successes of the Intelligence might be attributed to their secondary school education (after the tests) rather than to any innate superiority over the Controls. So he traced the records of the 7 Controls who also went to a secondary school, and of the 13 Intelligent who did not. These Controls were clearly not bright, were below the average of their schools, and none passed the School Certificate (though of the 37 Intelligent who went to secondary schools and have so far taken the Certificate, 30 passed). Of the 13 non-secondary Intelligent, at least 9 appear to have done very well.

The estimates of the head-teachers of these children's elementary schools are also interesting, for they show no significant difference between the two groups in health and character, but a marked difference in intelligence and a slight difference in home environment, the Intelligent being in each case the superior. The secondary school records of the Intelligent were distinctly above the average of those schools, and they had a really remarkable prize-winning record.

Turning to records after school-leaving age, Mr. Duff found that " 55 out of 60 Intelligent are likely to reach the occupational level of clerks, apprentices, or something better, i.e., 92 per cent. against 54 per cent. Control. ' Black-coated ' jobs are indicated for 70 per cent. Intelligent and 21 per cent. Control."

Generally, it may be said that the Intelligent replied better to the questions asked them, showed much greater mental interest and energy in their hobbies and other pursuits, aimed higher in their careers, and seemed more likely to achieve their aims. It is worth remark that equal proportions of both groups belonged to some juvenile organization, e.g., Boy Scouts (though the Intelligent showed slightly more promotion); and Mr. Duff comments, " If it means that the Scout and Guide movements make about as much appeal to the child of average intelligence as to the child of high intelligence, then they are doing something which the school curriculum fails to do."

All the numbers here involved, of course, were small, but they gave very definite and consistent results.

It was also possible to get some details of the families of the two groups. The parents of the Intelligent were slightly more mobile than those of the Control, while they produced fewer children—a mean of 3.5 against the Controls' 4.1. Of the brothers and sisters of the Intelligent 36 per cent. attended secondary school, while only 15 per cent. of the brothers and sisters of the Controls did so. The contrast in the occupations of the parents is equally significant—" At the top of the [occupational] scale the Intelligent Group's fathers are very obviously ahead of the Control's, and to a less extent at the midpoint; at the bottom there is no real difference between the groups. . . . It can be seen that the fathers of the Intelligent Group are not, as a whole, very distinguished or prosperous. Only those in the first two grades can possibly give their children any great advantages in the way of material environment over their neighbours; and even of these grades about half are schoolmasters, and not therefore men of great wealth. Material environment cannot account for the children's high intelligence. At the same time there is a very marked difference between the two groups; it is perhaps most easily seen by comparing the percentage in each group that reaches the level of skilled labour or higher (64 per cent. Intelligent, 28 per cent. Control)."

Similar differences, though not so marked, were found between the grandfathers, respectively, and the uncles of the two groups, and Mr. Duff comments, " The tables show exactly the same phenomena as would be expected if we were measuring not occupations but an inherited quality. The parents of a group of children selected for tallness will themselves be taller than average, but less so than the children; grandparents and uncles will show a further regression towards the average. In our case, we cannot estimate the regression from our Intelligent children to their parents, because the children's occupations are not yet determinable with certainty. But the further regression from parents to grandparents and uncles is plainly visible in the tables." There is no such regression in the Control group where, the children being already ' average,' the relations could not regress towards it.

" For the Intelligent, there ought to be a regression in intelligence, and there is in fact a regression in occupation, quite inexplicable except by the supposition—not a very rash one—that intelligence and occupation are correlated."

Finally, Mr. Duff discovered that the Intelligent had no distinguished relations, and he proceeds to discuss the reason. Personally, he rejects the view that the tests " may fail to measure the more profound regions of intelligence, upon which real intellectual eminence is based," though it is a view held by many well qualified to judge. Neither does he think that the level of the group was too low, since they were the best of 15,000—i.e., with a percentile rank of 99.5 or better, while the best 15 had 99.9 (one in a thousand). On purely statistical grounds one would certainly expect one in a thousand of the population to have a relative in *Who's Who*—I do not know what the actual figure is. On the other hand, looking forward to the future of these children themselves, as Mr. Duff does, one would expect, again on statistical grounds alone, only 12 of them to reach that rank, since a rough calculation of my own gives the *Who's Who* man as 1 in 1,214 of the population.

Mr. Duff also considers whether the children's prospective failure, and the relative's actual failure, to reach that degree of distinction may not be due to lack of character, a quality which is not measured by the ' intelligence tests.' This possibility he again rejects, on the ground that " men of the highest character who remain in obscurity for lack of high intelligence are surely far commoner than men of the highest intelligence who remain in obscurity for lack of high character." This argument, surely, is based on a confusion between ' high '—i.e., high moral—character and the temperament which makes for success. There must be many clever men, indeed, who, for the lack of ' drive ' and possibly of certain unpleasant qualities, have not attained distinction, while others at the top of the tree have little intelligence but enormous 'push.'

But the tests did not include the privately-educated children of comparatively wealthy parents, and were, therefore, not a fair sample of the population. So it is possible that a very intelligent or ' pushful ' section was excluded—granted some correlation between wealth and intelligence. Mr. Duff does not incline to this belief, since many of his Intelligent children " could meet the best of the privately-educated on equal terms in point of intelligence." He therefore concludes that while intelligence is an innate quality, little affected by the environmental differences of education, etc., its manifestation in

eminence is probably largely determined by social and economic advantages. One is bound to admit that there is much force in this argument, though it is not completely satisfying. The absence of the whole privately-educated class may really have resulted in the exclusion of certain qualities of intelligence or temperament not measurable by the tests.

E. M.

British Medical Journal

March 2nd, 1929.—*Bronzed Diabetes in a Woman.*—The case is recorded in a woman, the eldest of a family of eight. The second, a male, died of cancer of the liver at 30; he was also congenitally blind; the third, a male, died of epilepsy at 30; the fourth, a female, is congenitally blind and mentally defective; the 5th, a male, is normal; the sixth, a male, is physically normal, but is mentally rather dull; the seventh, a female, is mentally defective and congenitally blind; the 8th, a male, is normal. There is no evidence of syphilis in any of the family.

March 9th.—*The Descent of Man.*—The H. O. Thomas Memorial Lecture delivered by Sir Arthur Keith at Liverpool has been published in *The Journal of Bone and Joint Surgery*. He expressed the view that we may be descended from giant arboreal ancestors whose bodies became too heavy for climbing; they adopted, therefore, a terrestial life, and developed a high plantigrade foot. As to how the human foot developed to its present state the lecturer confessed his ignorance, but was certain that the change had been effected " by biological means which are still resident in the body and will be discovered."

Amaurotic Family Idiocy.—Dr. Stenhouse Stewart adds further notes of the R—— family tree. Shalem R—— had two sons by an unrelated wife. The younger at 25 was insane. The elder had three children—the first stillborn, the third normal, and the intermediate one died of " cerebral abscess "—probably amaurotic family idiocy.

Sterility.—From an analysis of 500 cases in the gynæcological department of Mount Sinai Hospital of Philadelphia, C. Mazer and J. Hoffman conclude that the male is primarily responsible in about 25 per cent. of cases of sterility, and indirectly for most of the infections resulting in female sterility. One out of every seven marriages in America remain barren.

Dr. M. Marcus in the issue of April 13th also emphasized the importance of consideration of the male as the cause of sterility.

March 16th.—*Bilateral Syndactylism.*—A case of this condition affecting the ring and middle fingers of each hand is recorded with X-ray photographs. A paternal uncle exhibited the same abnormality.

March 30th.—*Elephantiasis Neuromatosa.*—A severe case of this condition in a male Tamil is recorded with photographs. The mother was an achondroplasiac (?), and had a moderate degree of neuromatosis, as had also the maternal great-grandmother.

April 27th.—*Hereditary Angio-neurotic œdema.*—A case is recorded where the other members affected were, Mother (died), maternal uncle (died), two only brothers (died), and a niece. The three elder brothers and two sisters of the last-named were unaffected. The cases who died succumbed to œdema of the glottis. (Similar cases were recorded in the *B.M.J.*, 1902, i, 1470, and *Arch. Inst. Med.*, 1917, 20, 840.)

April 27th.—*Delinquency in Twins.*—A monograph, Verbrechen als Schichsal, by Professor Johannes Lange of Munich (Leipzig, G. Thieme, 1927, M.7) is reviewed. The author endeavoured to determine whether heredity or environment is the preponderating causal factor in delinquency in twins. Two boy twins living some distance apart both fell sick at the same time and were operated on for appendicitis. Two twins were petty swindlers and simultaneously became bald, fat, and diabetic. The author laid down the principle that in twins concordance in life's events is due to similar hereditary factors, while discordance implies their absence. From prison records he had collected thirty pairs of twins, thirteen uniovular and seventeen binovular, one of whom at least in each case had been convicted. In ten cases among the thirteen uniovular twins the partner had also been convicted (concordance); but among the seventeen binovular twins this had happened in only two cases, and in these two cases other causal factors were clearly traced, thus reducing the number to fifteen, in which only one of each twin pair had been convicted (discordance). Professor Lange gave full records of the ten cases of uniovular twins extending over fifty pages, demonstrating their concordance in body and behaviour. The hereditary factor in criminality was suggested from the observation that 77 per cent. concordance occurs in uniovular twins, as against 12 per cent. in binovular twins. The author estimated the other convicted brothers of uniovular twins as about 1 in 4, of binovular as 1 in 8.5, and quotes Viernstein's observations in Straubing prison on the ordinary convicted brothers of prisoners as 1 in 12. He held that if criminality is a compulsory matter, the result of laws we cannot withstand, there was no right to punish in the narrow sense. Security of the community was the aim of punishment, although not realized in the means. He advocated improved after-care and, more pressing still, reduction of alcohol; early recognition of delinquency through better criminal study; and prophylaxis through genetic measures—preventing individuals with active criminal heredity from being born.

May 4th.—*Sterilization of Mentally Unfit.*—At a meeting of the Medico-Legal Society on April 25th Lord Riddell read a paper on this question. He quoted statistics from the recent report of the Mental Deficiency Committee, and gave from official documents histories of mental defectives showing how to parents one or both of whom were feeble-minded there had been born four, five, or six children, all of them imbecile or of a low grade of mentality. He recited particulars of seventeen cases in the courts during the last two years in which mentally deficient persons had been charged with serious crimes. Lord Riddell estimated that the additional accommodation called for by the M.D. Committee would involve a capital expenditure of £29,000,000, and that the annual expenditure, representing the cost of maintenance of these feeble-minded persons, including those for whom provision is already made as well as the notified insane, worked out at £16,000,000. "Unless we are careful we shall be eaten out of house and home by lunatics and mental defectives." He strongly advocated sterilization, mentioning at the same time some of the objections.

In the discussion following, Lord Riddell's proposals found a considerable body of support.

A. A. E. N.

Difesa Sociale

Dec., 1928, VII.—*Quanti e quali individui doverebbero essere sottoposti alla sterilizzazione eugenica?* By Dott. A. Carelli.—This article is based upon the work *Birth Control and Eugenics*, by C. P. Bruhel, which surveys the subject of mental deficiency largely from the point of view of American experience, and discusses the proposed methods of control. The author quotes with approval the contention of Bruhel that "to speak of the imminent peril from the rapid increase of degenerates is extremely rash and unscientific." Another authority, Dr. A. O'Malley, is quoted as affirming that it is untrue to say that insanity and mental defect are notably increasing in the United States. The population of the country is rapidly increasing, and therefore the number of mental defectives is rapidly increasing, but not out of proportion to the increase in population. This author holds that the cry for extreme measures is based upon erroneous data.

Dr. Carelli discusses at length the two chief methods of prevention, viz., segregation and sterilization. He inclines to the former as the more humane, and argues that it should have a trial on a large scale before the policy of sterilization is put into practice. He quotes Dr. Jordan as holding that "the best policy for the elimination of the abnormal is segregation of defectives —epileptics, the insane, hereditary criminals, prostitutes—during the productive period, and good education for normal individuals regarding the precautions which should be taken in marriage to secure the physical and mental health of the candidates for matrimony, and the interests of probable issue."

Dr. Carelli holds that the general adoption of sterilization would crowd the hospitals and infirmaries, and lead to confusion and inefficiency. He also holds that sterilization would tend to a lowering of the humane temper which, upon the whole, is on the increase, that there would be a tendency to argue "these defectives are a grave obstacle to progress, suppress them!"

Feb., 1929, VII.—*Il Cancro e La Razza in Europa.* By Prof. Alfredo Niceforo.—Professor Niceforo dwells upon the difficulty of determining what we mean by "race." Race is not the same as nationality, nor is language a clue to it, nor the adoption of a uniform type of civilization. It is not a political, social, or psychological category. It is a biological fact.

The peoples of Europe are usually reckoned as three, viz., *Homo Nordicus, Homo Alpinus, Homo Mediterraneus.* Some authorities would add *Homo Dinaricus* and *Homo Orientalis.* Of the physical factors which characterize race the chief are the following—cephalic index, stature, shape and colour of the eyes, shape of the nose, pigmentation.

Obvious difficulties arise in estimating the incidence of cancer amongst the various races. Diagnosis of the disease may be difficult, and is likely to be more accurate in some regions than in others. Where the cancer ratio is low the number of deaths assigned to senility or to unknown causes may be high. Cancer cases tend to drift from regions where medical service is inadequate to regions where it is adequate. Cancer falls especially upon certain age periods, and there may be economic or other causes why individuals of such age periods may tend to concentrate in certain areas. Some countries have a very varied racial character. In Italy, for example, the north has a preponderance of *Homo Alpinus* or *Homo Dinaricus*; the centre has a preponderance of *Homo Alpinus* and *Homo Mediterraneus*; the South and the Islands have a preponderance of *Homo Mediterraneus.* All these considerations go to show that the relation of race to disease is a highly complicated one, and conclusions must be drawn with caution. The following figures are probably as accurate as can be expected:

MORTALITY FROM CANCER AT 40 YEARS OF AGE AND OVER.

ITALY.—200 per 100,000 inhabitants for the country generally.

From 313 to 140 in the regions of the north.
From 111 to 128 in 4 regions of the south (Mediterranean race numerous).

SPAIN.—220 per 100,000 inhabitants at 40 years and over for the whole country.

Regions where the Mediterranean race predominates have a rate of 219.

Regions where *Homo Alpinus* is present have a rate of 227.

PORTUGAL.—85 to 198 per 100,000 inhabitants of 40 years or over for the whole country. This figure is probably unreliable owing to defective statistics.

BELGIUM.—North Belgium is inhabited mainly by *Homo Nordicus,* South Belgium largely by *Homo Alpinus.*

The cancer mortality rate is 264 per 100,000 inhabitants in the former area, 233 per 100,000 in the latter area.

HOLLAND.—The population consists largely of *Homo Nordicus,* but there are areas where *Homo Alpinus* is in evidence.

The cancer rate in all Holland is from 295 to 419 per 100,000 inhabitants of 40 years of age and over. The rate is much higher in regions where the blonde type (*Homo Nordicus*) prevails than in regions where the brunette type (*Homo Alpinus*) prevails.

The cancer rate in Holland is much higher than in Italy, Spain, Portugal, and Belgium.

SWEDEN AND NORWAY.—The type *Homo Nordicus* prevails almost exclusively, and the cancer rate is high. Sweden, 334; Norway, 336.

AUSTRIA.—The country has many races.

It would seem that the cancer rate is highest in those areas where *Homo Alpinus* is dominant, but the greater accuracy of diagnosis in some of these areas has to be allowed for.

The relation of cancer to race is still obscure. The statistics on the subject are very incomplete. It will be seen that Professor Niceforo's figures relate only to a part of Europe. The subject will repay further inquiry.

J. A. L.

Genetics

Vol. 14, No. 2, March, 1929.—*The effect on crossing-over and non-disjunction of X-raying the anterior and posterior halves of Drosophila pupæ.* By J. W. Mavor.—This extensive paper shows that the whole effects of raying in increasing both crossing-over and non-disjunction may be obtained when the posterior half only, containing the ovaries, is exposed to direct radiation, while the anterior half is shielded. Much less effect is produced when the posterior half is shielded.

The Genetics of Platypœcilus. By A. C. Fraser and M. Gordon.—The fish which is the subject of these experiments (*P. maculatus*) has been shown by Bellamy to have sex-linked inheritance of the type found in birds and lepidoptera, in which the female is heterogametic. This is the more remarkable since Aida, working with *Aplocheilus,* and Winge with *Lebistes* had found the male to be heterogametic. Thus within a rather closely related group of fishes the same curious contrast in sex determination exists as the contrast between birds and mammals, and between lepidoptera and other insects. The paper presents experiments indicating that, as in *Aplocheilus* and *Lebistes,* crossing-over occurs in the sex-chromosome.

A cytological and genetical study of triploid maize. By B. McClintock.—The occurrence of a triploid individual plant in which three instead of two of the normal chromosomes were present has been utilized to study its genetical behaviour. Reciprocal crosses with ordinary diploid plants show a decided selection against pollen containing extra chromosomes, and some, but less, selection against the corresponding ovules. The presence of an extra chromosome is associated with a decrease in size and vigour, although the complete triploid was vigorous.

Vol. XIV, No. 3, May.—*Linkage groups of the Japanese Morning Glory.* By Y. Imai.—An important paper by Yoshitaka Imai summarizes, with the addition of much fresh material, the work of the author, and of other Japanese geneticists on the Morning Glory. Something like 100 genes have been detected, among the cultivated varieties of this plant, and their sports. Of these 34 are known to exhibit linkage, and can be placed in 10 linkage groups, which are here dealt with seriatim. The haploid chromosome number is 14, so that there is a probability that all the chromosomes will be mapped as the genetics of the species is further cleared up. The numerical values assigned to the linkage are not always the best that could have been derived from the data, and the method of estimation employed has evidently introduced unnecessary discrepancies between the estimates obtained from coupling and from repulsion respectively.

Two factors influencing feathering in chickens. By C. H. Danforth.—By grafting skin from chicks on to birds of different sex or genetic constitution further light can be gained upon the action of factors known to influence feather development. Certain breeds exhibiting a slow development of the feathers were known to contain a sex-linked dominant gene for this character. Where only this factor is concerned the graft partakes of the character of the donor, and the grafted patch may develop feathers much before or after the rest of the plumage. The Barred Plymouth Rocks, however, which develop

their feathers slowly, possess in addition a factor, possibly acting through the endocrine system, which inhibits the development of the graft equally with its own plumage. The genetics of this factor has not been studied. The important fact demonstrated is that factors for responsiveness to internal stimuli, or for the type of such stimuli produced, may vary independently, and become segregated in different strains. This point is of obvious importance for the evolutionary development of the sex-limited plumage of many birds.

R. A. FISHER.

Hereditas

Vol. XII, Nos. 1-2, March, 1929.—*On the result of simultaneous gametic and environmental correlations in a segregating population.* By O. Tedin.—The author propounds the problem, of obvious practical importance, of distinguishing gametic from environmental correlations between two measurable variates. No satisfactory solution is advanced, the point of the paper being to urge the need for mathematical work in the interpretation of genetic results. The author rightly concludes that " it may be of some value, if it increases the caution in the use of coefficients of correlation," and " it seems to the author that it demonstrates the limitation of the use of such correlations." The problem evidently requires not correlation coefficients, but a systematic analysis of the variances and co-variances, such as have already replaced the use of correlation coefficients over a large part of their field.

On the nature of the sex chromosomes in Humulus. By O. Winge.—As is well known, the hop plant produces pollen and ovules on separate plants, which are thus analogous to the sexes of most animals. The cytological observations, and most interesting discussion, in this paper suggest that in *H. japonicus* the sex-determining mechanism is such that the male has three sex chromosomes together with seven pairs of autosomes (14+3X) while the female has two sex chromosomes only (14+2X). Further, in *H. lupulus* two of the sex chromosomes in the male are found to form a permanent double X or Y chromosome giving a sex-determining mechanism comparable to that in *Drosophila* and Man.

A genetical investigation in Scolopendrium vulgare. By I. Andersson-Kottë.—The great popularity of ferns some thirty years ago led to the propagation of a large number of fancy varieties of many common species. In consequence, an immense variety of forms of the harts-tongue fern are still cultivated in England, although with change of fashion many collections are disappearing. Twenty-five varieties were used in the breeding experiments reported here, and although the numbers from individual crosses are not always large enough to make sure of the factorial position, simple mendelian results have been obtained in a number of cases. Thus a simple recessive dwarf was found, another for branching, and one for crenate edge. The total number of factors available with clear morphological effects must be large.

The recessive mutant 'engrailed' in Drosophila Melanogaster. By R. Eker.—Engrailed is a new recessive mutation in the second chromosome. It is situated about 7.1 units to the right of purple and about 9.6 to the left of Lobe. Viability and fertility are both good, and the mutant should be a useful one for further work.

R. A. FISHER.

Journal of Heredity

Vol. 20, No. 4, April, 1929. *Mental Traits of Identical Twins Reared Apart.* By H. H. Newman.—This is the third case in Prof. Newman's series, and should, like the others, be read carefully: a review is quite inadequate. It prompts him to the view that " each case of identical twins reared apart offers a distinct and peculiar situation that must be studied as a problem in itself. This is especially true of the present case."

These twins, unlike the others, were males, were separated in their first year, and did not meet again until the age of 22, about a year before the study was made. Judged by measurable physical characters, there can be no doubt of their monozygotic origin, and the tests indicate very strong mental and temperamental likenesses as well. Upbringing, too, though apart, was not very dissimilar; but " C " had slightly more formal education than " O," and his environment was more urban. Despite these facts, Prof. Newman comments on the marked difference in their personalities, a difference which is very evident in the photographs. Though their physical features are so very much alike, differences in personality have induced marked differences in expression of face. In physical characters their likeness is of right to right and left to left, indicating an early stage of cleavage.

Mr. Freeman Weiss also briefly records an instance of a defect of the tongue, resulting in very indistinct speech, which is undoubtedly hereditary and appears to be a dominant sex-limited character. There were four boys and four girls in the first generation traced, and all the boys and none of the girls had defective speech. One of the boys had, by a normal wife, four sons and four daughters; and, again, the girls were normal and the boys had defective speech. All the family are in other ways healthy.

Vol. 20, No. 5, May. *Order of Birth of Mental Defectives.* By Neil A. Dayton.—This is a valuable and exact survey of 10,455 ' retarded ' children of all kinds in the public schools of Massachusetts. The tables and figures show clearly that the oft-assumed connection between order of birth and mental deficiency (i.q. below 70) does not exist, aments tending to be neither the first-born nor the last of large families—if anything, indeed, they are more often in a middle position. ' Retarded ' children with i.q.'s over 70 follow the same order. It is difficult, therefore, to attribute these conditions generally either to maternal exhaustion through too frequent pregnancies or to asphyxia or trauma as the result of difficult labour. Heredity is left as the main cause.

It is also significant that families with a mentally defective child were found to be definitely larger (mean = 6.24 ± .03 S.D.) than families with a retarded child (mean = 5.71 ± .04 S.D.). Both figures, which include complete and incomplete families, are considerably larger than the normal. This, again, is an indication of racial factors, grade and degree of fertility being genetically associated with degree of defect.

Triplets in a Relatively Homozygous Family. By R. Ruggles Gates.—This case (from Alberta) is particularly interesting because the triplets, boys of eight years, are almost identical in appearance, though further examination disclosed certain minor, yet possibly important, differences. But the parents were both of practically pure Nordic ancestry, much alike in type, while their other nine children are also very similar. To Prof. Ruggles Gates the case is interesting in the light it may throw on other instances of ' identical ' twins or triplets. " Degree of similarity has hitherto been the sole criterion in addition to chorion and placental characters, as to whether similar twins or triplets are really identical, i.e., monozygotic. But it is obvious that the significance of such similarity will be emphasized if it occurs in a family in which the other sibs show great differences, and diminishes in a family where they show many similarities owing to the relative homozygosity of the parents. We are so accustomed to see hybridity in the human race that we fail to realize that if parents of any family were both homozygous in all their characters the children would be as much alike as peas in a pod, or at least as maize plants in a row."

The triplets are being further studied.

E. M.

The Medical Officer

May 25th, 1929.—A balanced article (which incidentally compliments eugenists on approaching the subject more seriously than most) on sterilization points out that the question is not one for physicians and pathologists, but for biologists. It continues, " Presuming that some forms of defection are really hereditary, does it follow that sterilization of the defectives themselves will cause their extinction? Surely not if Mendel's laws stand for anything!"

This is a common, but short-sighted, objection. The writer's apparent assumption is that the bulk of the next generation of defectives will spring from quite normal heterozygous ' carriers ' of to-day. But—momentarily granting that assumption—meanwhile the defectives of this generation are becoming the prolific parents of similar prolific heterozygotes in the next, who, in their turn will be responsible for the third generation of defectives. In short, sterilization to-day would have its greatest effect 25-30 years hence and thereafter.

But the assumption itself is unnecessary. By no means all forms of amentia are recessive, while there is considerable assortive mating among aments: hence elimination, by sterilization or segregation, would be by so much the quicker and more effective. Dr. R. A. Fisher has calculated that the numbers of aments now existing could be reduced by at least one-third in one generation. It is difficult to say what would be the effect in the next generation, but thereafter the rate of elimination would slow down, as the chances of heterozygote mating with heterozygote became fewer.

E. M.

CORRESPONDENCE

Eugenics and Bernard Shaw

To the Editor, Eugenics Review.

SIR,—In Section 16 of his characteristic and cleverly-written book, *The Intelligent Woman's Guide to Socialism and Capitalism,* Mr. Bernard Shaw invites consideration of the question, " What effect equality of income would have on the quality of our people as human beings."

At the outset Mr. Shaw raises two objections to the application of the stock-breeder's method of improving racial qualities in animals, to human beings, namely, that human beings must always exercise choice in the matter of mating, and secondly, that even if this difficulty of choice could be overcome, the method would fail because we do not know the kind of human beings which will be wanted in the future.

He goes on to add that while we know to a certain extent the kind of children we do *not* want, for instance, cripples, deaf mutes, blind, imbecile, epileptic, or drunken children, we do not yet know how to avoid producing them, as there is often nothing visibly wrong with the parents of such unfortunates.

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